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To sum up, the genus *Hypolimnas* is distinguished among Nymphaline genera for the extent to which its numerous and widespread species resemble the local distasteful forms of Eupleinæ or Danainæ.

Upon the older theory of Bates this would be explained by supposing that the genus is very hard-pressed in the struggle, and has thus been driven to mimicry almost everywhere. Upon the newer Müllerian theory it is supposed that the genus is distinguished among Nymphaline genera by some special defense, probably in the way of taste or smell or indigestibility, and that it has been to its advantage to adopt the advertisement of still better known and probably still more distasteful forms in its locality.

The abundance of the various species, the conspicuous *nerina* form of female, and the resemblance of a rare Danaid to it, the recent spread of *H. misippus* beyond the limits of its model, all support this latter interpretation.

NOTES ON ENGINEERING.

THE cost of power in New England cotton mills has been, of late, the subject of some discussion in technical and lay journals. The lowest cost yet reported, with one exception, is that given by Mr. Sheldon for the case of a mill which, paying \$1.76 per ton for coal, obtained the horse-power for a total cost per annum, including all items on the treasurer's books, interest, depreciation, taxes, etc., of \$11.64.

This figure was challenged and compared with the items generally given for other classes of engine which are usually two or three times as great and often much more. But the latest report comes from the Warren Steam Cotton Mill, where an engine of 1,950 horse-power, a cross-compound condensing machine, with cylinders 32 and 68 inches diameter and of five-feet stroke of piston, making 74 revolutions per minute,

steam at 155 pounds at the boiler, supplies power at the cost of 1.35 pounds of coal per horse-power hour. The engine was designed by Edwin Reynolds, the boilers built by the Heine Company. The following are the figures certified to Dr. Thurston by the treasurer of the mill. The engine replaces a quadruple-expansion engine, destroyed by fire, after seven years of excellent service. The change illustrates the fact that the cost of the higher grade of machine may more than compensate its exceptional economy; a fact which has only in late years come to be recognized.

In the following table of the costs of the new engine the figures come from the treasurer's books. Coal costs \$2.26 per ton, and in the account includes all costs of all steam used for all purposes, including banked fires, nights and Sundays, and that supplied the mill.

The following is a tabulated statement of the cost of power:

| | |
|---|---------|
| Fuel per horse-power per year of 3,070 hours... | \$ 4 70 |
| Labor..... | 1 88 |
| Supplies and repairs..... | 42 |
| Total operating expenses | \$ 7 00 |
| Interest at 5 per cent..... | \$ 2 05 |
| Depreciation, at 5 per cent..... | 2 05 |
| Taxes..... | 41 |
| Insurance..... | 04 |
| Fixed charges..... | \$ 4 55 |
| Totals cost of power per year..... | \$11 55 |

According to the Providence (R. I.) *Journal*: "This is lower than anything yet found. It is due to the large size of plant, which reduces the labor and supply account per horse-power, and to low cost of fuel and insurance and low cost of plant, on account of its size. The cost of plant includes a Green economizer, chimney, boiler-house, engine-house and foundations—all first class—and water-tube boilers, whose depreciation ought not to be over $2\frac{1}{2}$ per cent. If steam used for other purposes than power were deducted, it would reduce the fuel 10 per

cent., or 47 cents per year, per horse-power, making the total \$11.08. There is no way of separating this amount from the total in the regular accounts."

So far as known, this is the lowest cost of steam-power in any New England textile mill. The tons fuel per horse-power per year is 2.08—the lowest noted; others run about 2.20 tons per horse-power and upward.

R. H. T.

SCIENTIFIC NOTES AND NEWS.

PROFESSOR MICHAEL FOSTER will deliver several lectures in Baltimore in October and will visit Boston later to deliver a course of lectures at the Lowell Institute.

PROFESSOR JAMES E. KEELER, of the Allegheny Observatory, has accepted an invitation to make the dedicatory address at the opening of the Yerkes Observatory.

DR. FRIDJOF NANSEN is expected to arrive in New York on the steamer St. Paul, on October 23d. After visiting Washington as the guest of the National Geographic Society, he will give his first lecture in Carnegie Hall, New York, on October 28th. At the close of the lecture a medal will be presented to him by the American Geographical Society. The collections now at Stockholm will be brought to America and exhibited here.

SIR WILLIAM TURNER, President of the Anthropological Section, of the British Association for the Toronto meeting sailed from Montreal on the 22d. He will in future devote his time less to histological and more to anthropological researches.

WE regret to notice the death of Dr. Holmgren, since 1864 professor of physiology in the University of Upsala, at the age of sixty-six years.

THE following deaths are also announced: Dr. August Mojsisovics Edler v. Mojsvar, professor of zoölogy in the Polytechnic Institute at Graz; Mr. William Archer, F.R.S., librarian of the National Library of Ireland; Dr. T. Bogomoloff, professor of medical chemistry in the University of Kharkoff; Dr. John Braxton Hicks,

F.R.S., one of the pioneers of British work on diseases of women, and a Fellow of the Royal Society since 1862.

THE British Association, at the recent Toronto meeting, granted £1,350 for scientific research. We hope to give next week details of the appropriations.

THE French Academy has accepted a legacy from M. Pierre Lassere amounting to over \$100,000; the income from one-third of this sum is to be awarded by the Academy of Sciences for a scientific discovery.

A SMALL fund, founded in memory of Surgeon-Major Arthur Barclay, is to be used for a bronze medal to be awarded every third year by the Asiatic Society of Bengal for the most meritorious piece of work done in original research in biology, with special reference to India.

A BRONZE monument, erected in honor of Marcello Malpighi, the eminent Italian anatominist and botanist of the seventeenth century, was unveiled at Crevacore, near Bologna, on September 8th.

THE new museum of the Brooklyn Institute of Arts and Sciences will be dedicated on October 2d. Addresses will be made by President Eliot, of Harvard University, and by Mayor Wurster, of Brooklyn. There will be a reception in the evening in the Academy of Music.

IT is reported that plans have already been made for the new building of the American Geographical Society, New York, although the site has not yet been decided upon. The present building in West 29th street, purchased in 1875, has long been outgrown by the Society, and it has assets amounting to nearly \$400,000. The Society owes its present position and great growth to Judge Daly, who for thirty-three years has been its President.

THE Greek Archæological Society has secured possession of a quarter of Athens lying immediately under the Acropolis. The inhabitants will remove to the suburbs, and excavations promising important discoveries will begin shortly.

A SERIES of seven kites of the Hargrave type, sent up from the Blue Hill Observatory on Sep-